

REMARKS

Claims 26-42 and 44-49 are pending in this application. By this Amendment, claims 28, 30, 34 and 44 are amended for form and claim 49 is added. Support for new claim 49 can be found at least at page 8, line 4 - page 11, line 15. No new matter is added.

Applicants thank the Examiner for the indication that claims 26-42 are allowed. However, as discussed below in more detail, all of the claims are currently in condition for allowance.

Claims 44-48 are rejected under 35 U.S.C. §103(a) over Beckwith, Jr.¹ (U.S. Patent No. 4,939,678) in view of Chen (U.S. Patent No. 5,739,907) and further in view of Matsugu et al. (U.S. Patent No. 5,340,992). The rejection is respectfully traversed.

Beckwith, Chen and Matsugu fail to teach and would not have rendered obvious the claimed combination of features recited in independent claim 44. For example, Beckwith, Chen and Matsugu fail to teach and would not have rendered obvious "adjusting automatically at least one of a position of the transmitter unit and a movement vector of the second body in response to feedback from the determined position of the light beam on the detector in order to maintain the incoherent light beam on the detector ... measuring the deviation ... and recording said measurement," as recited in independent claim 44.

Beckwith merely teaches a measuring assembly 26 and a reflector assembly 28 that are aligned so that laser beams remain in alignment with the reflector assembly 28 as the RAM 20 is moved in the Z direction (col. 6, lines 33-42 of Beckwith). Indeed, the arrangement of Beckwith is the opposite of that recited in independent claim 44, where misalignment is allowed to occur, is subsequently corrected, and the correction is measured in order to measure the deviation of the first body relative to the second body. In contrast,

¹ The Office Action incorrectly refers to this reference as "Beckworth, Jr."

Beckwith teaches a measuring assembly 26 and the reflector assembly 28 aligned before any corrected measurement. Therefore, Beckwith does not teach the features of independent claim 44.

Chen does not remedy the deficiencies of Beckwith. For example, Chen fails to teach and would not have rendered obvious "measuring the deviation in the movement of the first body with respect to the second body at least in part from the adjustment of the at least one of i) the position of the transmitter unit and ii) the movement vector of the second body," as recited in independent claim 44. Rather, Chen is directed to a displacement (i.e., distance) measuring system for measuring changes in distances, and is in no way directed to a deviation measuring system as recited in claim 44. Chen merely uses the feedback for an automatic laser path alignment to keep the beams of the laser interferometer overlapped to provide a good interference pattern for measuring displacement (see Abstract; and col. 1, lines 5-9 and 59-62).

The teachings of Chen would have lead a skilled artisan on a path divergent from the invention recited in independent claim 44. For example, in Chen, deviations are measured using different sets of lenses (see col. 1, lines 40-43) or by obtaining and combining multiple diagonal measurements (see col. 3, lines 61-63). Therefore, it is clear that Chen considered the idea of measuring deviations, but still did not result in an arrangement where adjustments are made to correct the deviation and the corrective adjustments are measured and recorded. Further, due to Chen's use of a coherent beam, optical imperfections, optical surface damage and debris, it would be difficult to obtain an accurate measurement of the beam's location on the detector, and thus would be difficult to measure deviation in the manner recited in independent claim 44. Therefore, the teachings of Chen would have lead a skilled artisan down a path convergent from, and not consistent with, the recitations of independent claim 44.

Further, a skilled artisan would not have combined the teachings of Matsugu with that of Beckwith and Chen. The Office Action asserts that Matsugu teaches an incoherent light beam that is used to measure alignment (see page 3 of the Office Action). The Office Action further asserts that it would have been obvious to modify Beckwith to include an incoherent light beam because the incoherent light beam is "a simple substitution of a well known element for another to obtain a predictable result" (see page 3 of the Office Action). However, the cited passage of Matsugu (col. 12, lines 40-65) merely relates to an arrangement for aligning a wafer and a mask, and mentions that various light sources can be used including incoherent light sources. This arrangement is completely different from that recited in independent claim 44, where deviations and adjustments made for correcting deviations are measured and recorded as a first body and a second body move relative to each other along a line.

In addition, one skilled in the art would not have combined the incoherent light beam of Matsugu with the arrangement of Chen because doing so would have rendered the arrangement of Chen unsatisfactory for its intended purpose (see MPEP §2143.01(V)). As discussed above, Chen is directed to a laser interference system which requires a coherent beam, and would not function with an incoherent beam. Therefore, one of ordinary skill would not have combined the teachings of Matsugu and Chen as proposed by the Office Action.

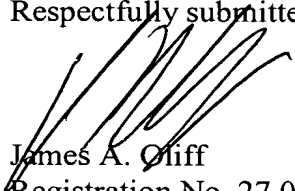
For at least these reasons, independent claim 44 is patentable over Beckwith, Chen and Matsugu. Claims 45-48 depend from claim 44, and are patentable at least for their dependency on independent claim 44, as well as for the additional features they recite. Applicants thus respectfully request withdrawal of the rejection.

Further, Applicants submit that new claim 49 is also patentable over the applied art.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Patrick T. Muffo
Registration No. 60,342

JAO:PTM/mef

Attachments:

Petition for Extension of Time
Request for Continued Examination (RCE)
Information Disclosure Statement with PTO Form 1449

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OLIFF & BERRIDGE, PLC
P.O. Box 320850
Alexandria, Virginia 22320-4850
Telephone: (703) 836-6400

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